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ABSTRACT

This paper explores the question of how quality is defined within the context of higher education in the context of the recent movements of education reform, technology in education, and quality management of education. It concludes that, to maximize the potential and strengths of each of these movements, they should be combined as a unified force. The basic assumptions about teaching, learning and assessment are discussed first. This section notes that many views of education reform are based on traditional behaviorist assumptions, but that real education reform must challenge assumptions about the nature of learning and how students learn. A discussion of the integration of technology into education argues that higher education must take the initiative in this area. If technologies are viewed as tools and communication devices, they can certainly be used to support education reform. A review of Total Quality Management (TQM) suggests that in education this approach leads to a shift from teaching and testing to continuous learning and improvement based on customer satisfaction, constancy of purpose, continuous improvement, and technique. The paper closes with a proposal for integrating these three movements demonstrating how together they can improve the quality of higher education. (Contains 32 references.) (JB)

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Now is the Time to Circle the Wagons:

Combining the Quality, Reform, and Technology Movements for Higher Education

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Paper Prepared for the 81st Annual Meeting of the
Speech Communication Association
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Abstract

Our educational system is undergoing tremendous demand for change. As educators reexamine the quality of teaching and learning at every level of education, three fundamental themes remain constant: education reform is necessary; technology is changing the nature of education; and education must be focused on quality improvement. These ambiguous themes are the subject of this paper. The research question is, "How is quality defined within the context of higher education?" In this paper, the concepts and assumptions supporting each of these bandwagons are described: education reform, technology in education, and quality management of education. Ultimately the argument is made that to maximize the potential and strengths of each, they should be combined as a unified force, that is, the wagons should be circled, in order to improve the quality of higher education.

Now is the Time to Circle the Wagons:
Combining the Quality, Reform, and Technology Movements for Higher Education

Over ten years ago, the publication, A Nation at Risk, sent shock waves throughout America by declaring that the erosion of our educational system was threatening our nation's future. A series of state and national reform programs were launched in an effort to raise educational standards through tougher course requirements and higher scores on standardized tests. The quality of teaching and learning was reexamined at every educational level. While many reform movements have caught fire and fizzled out over the past decade, several underlying themes have remained: quality in education, education reform, and technology in education.

Educators, legislators, parents, students, and anyone else with a stake in our nation's education system might be found jumping on either the quality, education reform, or technology bandwagons. While each of these movements share fundamental values such as improving the quality of education, the nature of improvement and quality is not always clear. For this reason, the research question driving this effort is, "How is quality defined within the context of higher education?" This paper explores these three movements and the advantages of combining them into one effort. Each movement has the potential to play an integral role in turning our educational system around and improving the quality of education. By bringing them together, circling the wagons, the strengths and potential of each can be maximized. To support this claim, education reform and it's basic assumptions about teaching, learning, and assessment are described. A discussion of the integration of technology into education and the philosophy of Total Quality Management follow. This paper closes with an integration of these three movements, education reform, technology in education, and TQM, demonstrating how together they can improve the quality of higher education.

What is Education Reform?

The Nature of Teaching and Learning in Education Reform

Marshall (1992) claimed that views of education reform involving standardized testing, nationwide curriculums and assessment methods are based on traditional behaviorist assumptions of learning. Behaviorism sees knowledge as a hierarchy of facts and skills that can be transferred from teacher or book to student, and to improve education means to raise existing standards and work harder. The hierarchy of knowledge needed to make an educated person is the same everywhere, thus reinforcing claims for a nationwide curriculum. Reform efforts based on behaviorist assumptions include incentives for teachers to improve their performance and an increase in the amount of content covered in a class or grade level (Marshall, 1992). Learning is viewed in this context as the passing of discrete elements from a static body of knowledge to a passive student body. As argued by Maxwell (1994), this view of education privileges economics and efficiencies over individualism and critical thinking. Evidence of learning comes in the form of averaged outcomes across all students (Marshall, 1992).

Deeply embedded behaviorist views of learning can be traced back to the industrial-age mode of schooling. Within this factory model, teachers conformed individual students to institutionalized outcomes (Bonstingl, 1993). Marshall (1992) referred to this as the "school as workplace" metaphor that values efficiency, uniformity, and passivity over creativity, individuality, and interactivity. The industrial-age version of learning requires that complex tasks be broken down into individual components to be taught separately. As students achieve a designated level, or fall short, they are rewarded or punished accordingly. Learning is context free; the same discrete set of facts can be taught in any situation in the same ways.

Education reform, if it is to truly reform, cannot begin with the idea that working harder and raising existing standards will transform our schools into exciting learning environments. Education reform must begin with rethinking the nature of learning and

understanding how students learn, and this challenges some of our existing assumptions about learning. For instance, some see learning as the acquisition of facts and skills. The teacher directs the drill and practice of those facts or skills and passes out the rewards and punishments. Learning also can be seen as acquiring strategies in order to perform tasks to meet the teachers expectations. Instead of internalizing the material and applying it to existing knowledge, students are merely displaying a skill for the teacher (Marshall, 1992). Related to these assumptions about learning is the notion that learning occurs as an event, taking place at a particular time.

Richter, Maxwell, and McCain (1994) described the approach to education that is based on students' acquisition of discrete facts as transmissional and suggested the dialogic approach where teachers and students come to mutual understanding and together create knowledge. This view of education mirrors the reform movement claiming that learning is socially constructed through interaction among individuals or between individuals and materials. Learning is not an event to be pointed to but a continual process. Teaching is not just transmitting content from one individual to another but must be concerned with a critical analysis of what is to be accepted as knowledge. Teachers should encourage students to integrate newly acquired knowledge with their existing base of knowledge and experience (Shale & Garrison, 1992). When students have the opportunity to validate new ideas through interaction with teachers and fellow students, new knowledge is created. Learning is a social activity.

Education reform must center on providing students authentic, challenging tasks (Means, 1994). Much of traditional instruction is broken down into distinct unrelated parts and skills that have little relevance for students outside the classroom. This does not motivate students to apply skills and concepts learned in school to their lives outside the buildings.

Means (1994) provided an excellent comparison of traditional (behavioristic) instruction and instruction based on education reform:

Conventional Instruction	*Reformed Instruction*
Teacher directs.	Students explore
Instruction is didactic.	Instruction is interactive.
Students receive short blocks of instruction on single subject.	Students perform extended blocks of authentic and multidisciplinary work
Students work individually.	Students work collaboratively.
Teacher is knowledge dispenser.	Teacher is facilitator.
Students grouped by ability.	Students grouped heterogeneously
Students who have demonstrated mastery of "the basics" work on advanced skills.	All students practice advanced skills.
Students assessed on fact knowledge and discrete skills.	Students assessed on performance.

(Means, 1994, p. 6)

Within the framework of education reform, students explore subject areas not for the purposes of performing well on a test, but to understand how certain phenomena work together as part of a whole. By working in teams, students learn to negotiate with peers and find solutions that incorporate various perspectives. They learn to justify their own ideas and actions which helps them become more critical reflective thinkers. The role of the teacher shifts from keeper and distributor of knowledge to one of a facilitator, supporting the students as they explore and create new knowledge.

Learning is situated in social contexts; it is not context free. The social context influences norms, roles, behavior, and expectations in the learning environment. Collins and Green (1992) viewed the class setting as a culture that is constructed by those in the class, including teachers and students. Within this culture, the social context influences the opportunities students have for learning, what it means to learn, and what it means to be a student or teacher within a particular classroom. The everyday interactions within a classroom determine what counts as learning, whether that is memorizing facts and formulas or gaining a deeper understanding of concepts and relationships (Blumenfeld, Puro, & Mergendoller, 1992).

The Role of Assessment and Education Reform

How well are students learning? How effectively are teachers teaching? These are fundamental questions in the efforts to improve the educational system. Colleges and universities across the country are under more and more public and political pressure to explain what they are trying to do and who how successful they are at doing it (Angelo & Cross, 1993). Angelo and Cross (1993) suggested that the common goal of all colleges and universities is to help students learn more effectively and efficiently than they could on their own. Too often teachers assume students are learning what they are trying to teach throughout a semester only to be disappointed when test grades show differently. The assessment methods used in many higher-education institutions today reinforce the passive uniformity of the industrial age. Emphasis on pre-determined standards, testing, and achievement has resulted in students being obsessed with finding out, "What do I need to know for the test?"

The education reform movement claims that assessment should be compatible with meaningful tasks that are closely related to real-world knowledge and skills rather than standardized tests (Camp, 1992; Means, 1994). A collaborative-group project, for instance, can say much more about what students have learned through authentic and challenging tasks than their achievement on a series of multiple choice items with little real-world relevance.

Camp (1992) argued that instruction and assessment can only be understood together; to understand one requires understanding the other and seeing both within the context of an educational institution. If new assumptions of learning shared by those on the education-reform bandwagon are to be adopted, new means for assessment must be established that accommodate this type of learning. Learning based on complex performances where students integrate a variety of skills and call on different kinds of knowledge and mental representations might be difficult to measure with a standardized test. As a matter of fact, education reformers see multiple choice tests based on distinct tasks and limited responses as detrimental to genuine learning (Camp, 1992). Assessment

should be based in complex and meaningful tasks that are consistent with learning goals. Within the framework of education reform, assessment should be "closely related to real-world skills and challenges, that allow students to use the processes and strategies relevant to genuine performance. In these performance assessments, knowledge and skills should be integrated rather than presented as discrete entities" (Camp, 1992, p. 244). Suggestions for performance-based assessment include extended essays, hands-on activities, computer simulations, portfolios, and exhibitions (Camp, 1992).

Technology in Education

The convergence of computers, telecommunications, and digital technology promise to alter forever the way information is created, stored, distributed, and collected. The policy issues facing education within the context of an information-based society were explored by McCain and Maxwell (1994). They suggested that higher education must take the initiative with regards to the integration of technology into the educational environment and do so with input from the users, that is, the departments, instructors, and students.

The chancellor of the University of Maryland System claimed that recent and future advances in information technology will not just support the traditional academic activities, but will result in major changes in the very structure and character of our universities (Langenberg, 1992). He stated that "the convergence of the needs of an increasingly decentralized student population with the emergence of an intrinsically delocalized academic information infrastructure will inevitably change the form and nature of many of our institutions in profound ways" (Langenberg, 1992, p. 17).

In most instances, technology has been introduced into schools to improve the effectiveness of what is already being done. Likewise, the technology seen on most campuses is mainly used to improve the efficiency of existing activities, such as automated card catalogs and student registration. Teachers and staff are often threatened by

technology when it is integrated for the reasons of improving efficiencies. These negative feelings towards technology only diminish its chances of making a positive difference.

Perelman (1992) suggested a radical alternative to the notion of integrating technology to support what is currently being done. He called for a new generation of technology to revolutionize the social role of learning and termed the word "hyperlearning" to describe this new wave of technology. "Hyper" referred to the "unprecedented degree of connectedness of knowledge, experience, media and brains - both human and nonhuman" (Perelman, 1992, p. 23). "Learning" applied "most literally to the transformation of knowledge and behavior through experience" (p. 23). His hyperlearning revolution called for replacing schools with hyperlearning channels and "a world freed of the encumbrance of education altogether" (p. 63). He described learning as an action done *by* not an action done *to* the learner. This shift in perspectives requires a new view of learning that Perelman believed is inevitable in the next century.

So on one side, technology can be introduced into the educational setting to improve the efficiencies and effectiveness of what is currently being done. On the other side, Perelman suggests that technology will do away with education all together. Are these the only options? Absolutely not.

Technology and Education Reform

Means (1994) argued that technology can support exactly the kinds of changes in content, roles, organizational climate, and activities that are at the center of the education reform movement. The only way technology can be used to support higher forms of learning is if it is viewed as a tool to support new curricula and instructional goals that are based on the assumptions of education reform. With this approach, "technology is not viewed as an end in an of itself but as a support for ... {enabling} student involvement with complex authentic tasks and new organizational structures" (Means, 1994, p. 4).

To advance her argument that the integration of technology into schools can fully support the ideals of education reform, Means (1994) provided a classification scheme for

categorizing technologies not by their hardware features (i.e., pc, vcr, CD-ROM), but in terms of the way they are used for instruction. The four basic uses of technology in education include: tutorial, exploratory, application, and communication. Tutorial uses are those characterized by the technology doing the teaching; the system controls what material is presented to the student. Examples of this include computer-assisted instruction and instructional television. Exploratory technologies allow the learner to roam around the information displayed. This is different than the previous use in that tutorial technologies act on the student and with exploratory technologies the student controls the material. Examples of exploratory include CD-ROM encyclopedias and other multimedia systems. Application technologies help students by providing tools to facilitate their learning efforts. Examples of these include video and editing equipment, desktop publishing, and other software packages. And finally, communication technologies allow students and teachers to send and receive messages through networks or other technologies. Examples of these technologies include two-way video teleconferencing, electronic mail, and computer conferencing (Means, 1994).

The first two uses, tutorial and exploratory, resemble the notion that a teaching machine might instruct better, or at least more efficiently, than a person. However, the current trend is toward the third and fourth uses, application and communication, that refer to applying technology as a tool and a vehicle for improved communication.

The use of technology for applications and especially for communication fits nicely with the social constructivist approach to teaching and learning. These technologies do not contain instructional material so they are flexible and adaptable to most any academic setting (Means, 1994). If technologies are viewed as tools and communication devices instead of new boxes or reinforcements for existing activities, they can certainly be used to support the types of learning activities called for by education reform.

What is Total Quality Management?

Total Quality Management (TQM) is a comprehensive philosophy of living and working in organizations that emphasizes a relentless pursuit of continuous improvement (Chaffee & Sherr, 1992). Initially introduced as a management philosophy for business and industry, TQM is being applied to government and education as well. W. Edward Deming, a world renowned statistician and consultant, is considered the father of TQM. He and his ideas about total quality are credited for much of Japan's rise from their disastrous state following World War II to world superpower and economic leader in the 1980s (Hazzard, 1993). Deming's ideas have been touted as the method for leading public education out of its current state in the same ways it resurrected industry in Japan and is attempting to do so in America (Capper & Jamison, 1993). TQM is virtually content free, meaning its principles could benefit an airplane factory and a consultant firm, a psychology class and an accounting course.

What does TQM have to do with education?

Since the early 1990s, many business leaders and educators have attempted to adapt Deming's ideas to the educational setting. While education reform calls for a shift from teacher-centered to learner-centered education, TQM, within the context of education, calls for a shift from teaching and testing to continuous learning and improvement.

Several fundamental concepts of TQM that seem most salient in the context of education include customer satisfaction, constancy of purpose, continuous improvement, and technique.

Customer Satisfaction. Long term customer satisfaction must be the goal of any organization implementing TQM. This satisfaction is earned through offering quality products and services that help the customer live a better life. Quality is defined by the user's expectations. This primary focus on earning customer satisfaction and loyalty results in a customer driven organization. Deming suggested that customer feedback serves as the fundamental definition of quality (Capper & Jamison, 1993). Based on this feedback, a product, service, or process can be constantly improved.

In business and industry, the customer is easily identified, but who is the customer within the context of education? A customer is someone who receives your product or service; in order to succeed, you must satisfy their quality requirements. Understanding those requirements involves establishing and maintaining feedback mechanisms (Schauerman, Manno, & Peachy, 1993). Chaffee and Sherr (1992) suggested that students are the beneficiaries of the teaching process. Williams (1993) also maintained that students are the primary customers especially in higher education. He believed that as more and more college students are returning to school after spending time in the workforce, they have a clearer idea of why they are going back to school and what their particular needs are. He claimed that "universities that do not treat their students as customers entitled to an efficient and high quality service will lose out to those that do" (Williams, 1993 p. 235). If students are considered the beneficiary of the education process, the process cannot be effective unless teachers and administrators understand students' needs. Schmoker and Wilson (1993a) argued that one of education's major blind spots continues to be overlooking the students' needs and preferences. They also suggested that viewing the students as customers might help us dispel the notion of students as passive recipients.

Chickering and Potter (1993) warned against focusing too narrowly on satisfying the student. The problem lies in the fact that giving students what they want does not necessarily lead to high-quality education. They argued that a big difference exists between education based on giving students what they want and education based on informed decisions about individual student needs. "Higher education's most important function is to help students clarify their future plans, understand what is needed to realize those plans, design a program that moves them toward their goals, and teach them how to keep progressing on their own" (Chickering & Potter,1993, p. 36). One business professor goes to great lengths to ensure his students participate in coursework they find meaningful and applicable to what they want from life (Schmoker & Wilson, 1993b). He

spends the first week of every course establishing purpose and helping students understand the contribution of their studies to their personal and career goals.

Constancy of purpose. According to Deming, the fundamental principle critical to transforming an organization is to "create a constancy of purpose toward improvements of product and service" (Deming, 1986). Constancy of purpose can only be achieved if everyone in an organization is focused on the same purpose. This allows organizations to continue meeting current customer needs while determining and meeting future needs.

Schmoker and Wilson (1993b) described recent studies in psychology revealing that people have to feel that their work is purposeful and has meaning beyond collecting a paycheck (or just getting a passing grade). People work with more commitment toward collective goals than toward merely individual ones. Frequent, precise feedback and assessment of meaningful activity are essential to improvement and enjoyment (Csikszentmihalyi, 1990). In other words, people need to see that they are getting better at what they do.

Related to this notion of constancy of purpose, Deming differentiated between actions that an organization takes to meet immediate needs of the customer and actions taken to plan for customers' future needs (Monk, 1993). Innovations are described as actions taken to meet either existing or anticipated needs. After thoroughly researching concepts or ideas, determining the costs, determining the value to the customer, and training employees, innovations are introduced. Innovations must contribute to the organization's ultimate purpose. This view of innovative action stands in stark contrast to the typical educational innovations that follow a cycle of enthusiasm, widespread dissemination, subsequent disappointment, and eventual decline (Monk, 1993). Under TQM, innovations are only introduced for the purpose of improving the quality of what is offered to customers, not for the purpose of making the job easier or to attract attention.

The biggest challenge for higher education is to determine its purpose. Is the purpose to develop autonomous individuals able to think critically, make sound

judgments, and communication with others (Maxwell, 1994)? Is the purpose "to prepare students to flourish in the new high-performance organizations?" (Schenkat, 1993, p. 65). Is the purpose simply to help students learn more effectively and efficiently than they could on their own (Angelo & Cross, 1993)? Or should schools focus on helping students maximize their own potentials through continuous improvement of teachers' and students' work together (Bonstingl, 1992)? Maybe this is something more easily answered within a particular classroom involving a particular learning goal. Whatever it is, in order for TQM to work for higher education, there must be agreement on the overall or unique purpose.

Continuous improvement. This involves a commitment to getting better overtime. Improvement is not a one-time accomplishment, but instead refers to incremental improvements to a quality product or process. The status quo is unacceptable. Improvement does not result from focusing on the end product but from focusing on the systems that create those end products. Instead of saying, "If it ain't broke, don't fix it." TQM followers say, "If it's not broken, make it better." (Chaffee & Sherr, 1992).

Within TQM's notion of continuous improvement is where assessment fits into this framework. According to Chaffee and Sherr (1992), assessment at the post secondary level served two purposes: 1) demonstrated that colleges and universities are achieving their intended purpose (serving as a form of accountability); and 2) provided information that permits faculty and administrators to improve what they do (serving an improvement function). Traditionally, assessment has been far more concerned with accountability than with showing those involved in the process how to achieve better results (Ewell, 1991). Assessment that occurs at the end of the year is aimed at inspecting quality into education at the end of the line. Assessment typically focuses on the student rather than the learning process. These methods have no way of identifying flaws in the process, but instead they identify flaws in the students. When the grade is the bottom line, students focus on short-term retention not long-term learning.

TQM and the notion of continuous improvement offer a much more effective and challenging alternative. To identify faults in the process, teachers must fully understand how the process works to achieve the expected results. For instance, faculty need to have clearly identified the knowledge, skills, and attitudes they require at the end of a course or program and be aware of when and where in their particular course students are expected to learn the identified knowledge, skill, or attitude (Chaffee & Sherr, 1992). Knowledge of how the process should work can highlight where problems exist. Assessment involves detecting defects. Continuous improvement involves preventing defects. Quizzes, tests, and final exams are not only for testing the student, they should also be used to test instruction and learning. Relying on tests as the dominant means of assessment is often unreliable and not representative of actual learning. Tests and other indicators should be used for diagnostics throughout the learning process (Bonstingl, 1992). Their results should immediately be analyzed and integrated into the learning process. Learning is best shown by students' performance applying information and skills to real-life challenges. Teachers should seek ways to determine if a particular mode of instruction, such as lecturing, is most appropriate for particular subject matter, or if role playing or small group projects might be more useful. TQM perspectives of assessment emphasize the fact that learning occurs one student at a time. Assessment is not an end in itself but rather a step in the journey to improving the entire system, both teaching and learning.

According to Kohn (1993), if TQM has any message for educators, it is the call to abolish standardized tests and grades as these reinforce a competitive environment that can hinder creativity and growth. Instead, TQM calls for a cooperative learning environment. One instructor's efforts at TQM have included the elimination of grades. Instead, the instructor no longer accepts anything less than what he and his students regard as quality work (Schmoker & Wilson, 1993b). A learning environment based on TQM requires trust and mutual support as individuals learn how to assess their own work

and that of their peers (Bonstingl, 1993). Students should be encouraged to establish benchmarks so they can see how their own efforts are continually improving.

TQM's technique. Fundamental to TQM is that a process cannot be improved without data (Chaffee & Sherr, 1992). A wide array of tools are offered for identifying problems, finding their root causes and eliminating those causes. Recognizing that all work is part of a process, Deming provided the Plan-Do-Check-Act (PDCA) cycle as a method for the quality improvement process (Deming, 1986). Through the PDCA cycle, data can be collected on the problems, and changes can be implemented to improve the process (Macchia, 1993). This four-step process begins with *planning*. Adequate time must be spent to understand the nature and causes of a problem, collect data on it, and use the data to inform the definition of the problem, the understanding of its root causes, and the decision about potential solutions (Chaffee & Sherr, 1992; Monk, 1993). This data can be used to develop a theory for quality improvement. The second step is *do*--implementing the innovation or change on a small scale (Monk, 1993). The next step, *check*, calls for collecting data to determine if the action had the desired effect. The final step is act, which involves implementing the innovation permanently in all appropriate areas. Accurately following through each of these steps is challenging, time consuming, and well worth the effort. The temptation to fix the most obvious problem often results in the root causes going unattended (Macchia, 1993). Also, quick fixes in one area can cause unanticipated problems in another area. The PDCA process can help ensure a particular problem does not reappear down the road (Chaffee & Sherr, 1992).

In addition to the PDCA cycle, TQM offers a variety of tools for collecting and analyzing data. The primary use of these tools is to identify and reduce nonrandom variation (Macchia, 1993). This type of variation destroys quality. Flow charts, cause-and-effect diagrams, run charts, control charts, check sheets, and Pareto charts all provide tools for identifying root causes and improving quality in processes. This disciplined approach to problem solving helps to ensure that root causes are addressed not only the

symptoms. The reduction of variation is applicable to education. While the goal is not to reduce variation in terms of critical thinking in students, efforts should be made to reduce the causes of the variation within the educational process that lead to students failing (Macchia, 1993).

A Critical Look at TQM

Not all educators are jumping on the TQM bandwagon. Capper and Jamison (1993) argued that TQM only reinforces the "school as factory" metaphor, and its processes confirm the established hierarchy of customer, worker, and management. They also criticized TQM's reliance on the "scientific method" using quantitative collection procedures and statistical analysis. They suggested TQM advocates also incorporate interviews and observations into their efforts. Ultimately, Capper and Jamison (1993) claimed that without a clear picture of what the purpose is, TQM may only reinforce educational and societal inequities.

Kohn (1993) also challenged us to seriously consider the nature and purposes of education before carrying TQM into the classrooms. He voiced strong concern over the notion of students as customers stating that this view places much more emphasis on improving corporate competitiveness rather than developing self-directed lifelong learners. Kohn (1993) believed that seeing students as future employees distorts learning into economic terms and ignores learners' immediate needs.

Circling the Wagons

This paper began by claiming that education reform, technology in education, and TQM would be more effective for improving the quality of higher education if they were combined as one effort rather than viewed as separate movements. How would an instructor go about integrating these ideas into a course?

The first step is to determine the purpose and learning goals of the particular course. This is highly-context specific and based primarily on the individuals in the class and the content. Initially, instructors need to clarify what students in a particular course need to

learn. The purpose and goals must be explicit enough so that the instructor and students can be able to determine the extent to which they are being met. For instance, the goal "to teach college algebra" is far too broad. Instead, specific skills should be articulated along with competencies that students should be able to demonstrate at the end of the term, such as, "students should be able to define and solve real-world problems in engineering by applying linear algebra." Once this specific goal is set, establishing challenging authentic activities through which these real-life skills can be learned should follow.

The tendency to breakdown tasks into distinct components with little apparent connection to anything outside the classroom not only drains motivation, it also makes it unlikely that skills can be transferred to real life. The design of a college course should incorporate meaningful authentic tasks so students can be more active in defining and regulating their learning (Means, 1994). Considering TQM's ideas about customer, or learner satisfaction, contemporary college students have a better idea of what they are in school for, and this should be considered when establishing the purpose and learning goals. If possible, instructors should meet with students at the beginning of the term to find out their previous experience with the subject matter, their expectations for the class, and how they see it applying to their personal and professional goals. Since the course includes the flexibility of meaningful tasks, rather than predetermined drill and practice exercises, adapting to individual needs is much more possible. Students should be encouraged to identify their own learning goals and incorporate them into the overall purpose and goals of the class. Once the purpose and learning goals have been set, and these goals incorporate what the instructor believes the students should learn combined with the learners' individuals goals, the next step involves continuous improvement.

To continually improve the teaching and learning process, students need to receive appropriate and focused feedback (Angelo & Cross, 1993). To be effective, this feedback must be early on and focused enough to help the students make appropriate modifications.

Assessment can be a useful tool for finding out if students are learning, for providing timely and useful feedback, and for determining if teaching practices need to be modified. The purpose of assessment is not to evaluate the students but to improve the quality of learning. For example, in a linear algebra class, a quiz given to students at the end of a section may be much more useful for students if it is based on solving a real-life problem and not simply plugging in formulas. Rather than collecting the quizzes and returning them next week, instructors can encourage students to form groups and discuss their answers with each other. Each group then can share with the whole class the options they considered and why they chose one particular option as their solution. When students turn in their individual quizzes, teachers can see how each compares to the group decision and can gain a sense for how each student is doing. Quizzes are not simply an opportunity to display what has been learned, they are an opportunity to continue learning.

For continuous improvement to take place, teachers must understand the process of learning in their class. Assessment techniques, focused on improving learning within a particular learning context, can help teachers identify flaws in the process. Through regular assessment, teachers may determine that several students are not understanding a portion of the algebra needed to complete problems. The root cause of this problem needs to be determined. Maybe the teacher should meet with the students individually. Teachers may consider conducting special study sessions or assigning students to partners so together they can help each other learn. The teacher can try a particular approach on a small scale and then assess it to see if it is helping. If students seem to learning better, maybe it would be appropriate to integrate the solution throughout the whole class. The teacher has just progressed through TQM's PDCA cycle, plan-do-check-act.

This type of assessment stands in stark contrast to quizzes or exams that result in a grade and students never revisiting them to see what they understood and what they missed. That form of assessment does little to improve the learning. Exams are not the only source for determining if learning is taking place. As suggested through the

education reform movement, assessment also can be in the form of group projects, presentations, and student journals or portfolios. Determining which method of assessment is right and making appropriate adjustments is highly contextually bound. This depends on the learning goals, the individual students, and the instructors commitment to continuous improvement.

Within the framework that combines education reform and TQM, the role of new technology is as an innovation. The TQM literature describes an innovation as something that must contribute to the ultimate purpose, to improving the quality of learning. This requires a thorough understanding of the learning process within a class, assessment that identifies the flaws that may exist in that process, ideas for possible solutions (or innovations) for addressing the root causes, and research indicating how the innovation should be integrated into the class. Under TQM, innovations are not introduced to make a job easier. Innovations are only introduced to improve quality. With regards to technology, it should not be brought into a classroom to improve the efficiencies alone; it should be integrated into the class if it is determined that it would improve the quality of the learning experience. Means (1994) described how technology can do this if it is used to enable or support student exploration, interactive learning, authentic multidisciplinary tasks, and collaborative work. This is where technology fits within the framework of improving the quality of higher education. For example, if a french teacher realizes, through interaction with students and assessment techniques, that students are not getting enough experience conversing in french, a computer conferencing system could be established for students where they can only post messages and respond to each other in french. The teacher can monitor the conference and incorporate it into the classwork. The technology must support the purpose and learning goals of the class.

Conclusion

All three of the movements discussed in this paper can make a positive difference in education today. Education reform is based on the ideals of higher order thinking skills

and an approach centered on the learner, but it does not necessarily provide clear guidelines for its implementation. TQM provides guidelines and tools for improving the quality of education, but it does not provide a contextual base from which to begin. Technology can make possible many exciting activities in a class, but it requires direction; it cannot be introduced for its own sake. Therefore, by combining each of these, education reform gains a much clearer set of guidelines through TQM; TQM gains a clearer sense of purpose and context through the ideals of education reform, and the integration of technology into education stands a much stronger chance of being used to support higher order learning skills as opposed to supporting activities that have always been done through the direction of TQM and education reform.

At the beginning of this paper, the question was posed, "How is quality defined within the context of higher education?" The answer is,"it depends." Quality higher education is defined by the students and teacher within a particular learning experience. It involves the ability to apply skills learned in the classroom to the meaningful, real-life activities of the student, and it involves the continuous improvement of the learning process. Quality is not defined by test scores, dollars spent on technology, number of tenured professors, or starting salaries of graduates. Quality is highly individualized, deeply contextually bound, and extremely dynamic. To achieve quality in higher education requires a commitment to an education reform centered on continuous learning and improvement through authentic challenging tasks, and a belief that technology is not the ends but only the means for improving the quality of learning in the classroom.

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